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The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

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FUNGI ASSOCIATED WITH DECLINE OF AVOCADO AND CITRUS IN CALIFORNIA (II)

James V. Harvey

As the survey of the fungi associated with avocado and citrus decline in California continues, interesting data are accumulated. Prior to this survey, attention had been directed to the Phytophthoras as possible causative agents of the disease, especially P. cinnamomi in avocado and P. citrophthora in various Citrus species. The present study was undertaken to verify or deny the above, and to find out if other fungi might be of concern in declining trees.

Collections of soils and root samples were made from both healthy and distressed trees, from which specimens various fungi have been isolated. About 25 species of molds, mildews, and other fungi have been identified, and accurate records of their frequency of appearnace have been kept. Only those fungi that have appeared consistently from roots of declining trees or those that are known as parasites are tabulated in this report. These include species of Phytophthora and Pythium, as well as Trichoderma lignorum. Fusarium and Fusarium-like forms have occurred in about 95% of all samples, thus being of no particular significance. Other isolations have been of interest (and often very numerous) but insignificant as causative agents: Mucor racemosus, M. circinelloides, other Mucors, Rhizopus nigricans, species of Thamnidium and Zygorrynchus, Aspergillus niger, Aspergillus sp., the genera Penicillium, Geotrichum, Sporotrichum, Alternaria, Botrytis, Tilachlidum, Verticillium, and several unidentified Ascomycetes.

Phytophthora cinnamomi (the "cinnamon fungus") has been most frequently isolated from declining avocados and less numerously (by far) from non-declining avocados. Healthy trees yielding the fungus have been those growing near infected trees in decline areas. Conversely, it is worthwhile to note that in wholly healthy groves or in isolated non-diseased portions of affected groves this fungus has not been taken.

Of 307 avocado trees examined, 164 yielded Phytophthora cinnamomi, whereas 143 did not. Many of the latter showed evidences of improper care, as over-cultivation, lack of proper fertilizer, etc. Of 268 non-declining avocadoes studied, 222 did not produce the fungus when roots were cultured on various kinds of agar. The 46 trees that yielded P. cinnamomi were, for the most part, in distressed groves.

In the following table, the distribution of P. cinnamomi is given by counties. In this study, both declining and apparently healthy trees are considered. A plus sign (+) indicates the presence of the parasite (P. cinnammomi) and the minus sign (-) tells of its failure to appear in culture:

County	Declining avocado trees		Healthy avocado trees	
	(+)	(-)	(+)	(-)
San Diego	57	36	11	66
Orange	19	23	6	0
Los Angeles	50	47	28	62
Ventura	0	2	0	2
Santa Barbara	38	26	1	55
San Luis Obispo	0	4	0	7
Santa Cruz	0	0	0	12
Santa Clara	0	5	0	4
Tulare	0	0	0	4
Miscellaneous	0	0	0	10
	164	143	46	222

One other species, Pythium vexans, has been consistently present in diseased roots, often in the same cultures with P. cinnamomi, according to the following table:

County	Declining avocado trees		Healthy avocado trees	
	(+)	(-)	(+)	(-)
San Diego	30	63	22	55
Los Angeles	54	43	35	55
Orange	24	18	2	4
Ventura	2	0	0	2
Santa Barbara	38	26	22	34
San Luis Obispo	0	4	0	7
Santa Cruz	0	0	0	12
Santa Clara	0	5	0	4
Tulare	0	0	0	4
Miscellaneous	0	0	0	10
	148	159	81	187

Species of Phytophthora that have been infrequently taken, not necessarily associated with avocado decline, are P. parasitica, and P. cactorum. Similarly for Pythium, isolated species include P. ultimum, P. anandrum, P. debaryanum, and P. monospermum.

Phytophthora citrophthora has been missing altogether from avocado groves, whereas P. cinnamomi has been isolated once from Citrus (a non-declining Valencia orange). Likewise, Phythium vexans has been taken only once from Citrus (again a Valencia orange). However, in Citrus the frequency of appearance of Pythium ultimum has been significantly high in declining trees.

In order to interpret the frequency occurrence of Pythium ultimum in Citrus, in northern and southern areas, it might be well to note that, in over 7 years of research on the true water molds (Saprolegniaceae), the observer has seldom obtained Saprolegniaceous species north of the Tehachapi

Mountains and north of Ventura County, whereas such species have been plentiful at lower elevations south of the latitude named. Members of the Pythiaceae appear to follow the same distributional pattern, although attempts by the writer to obtain these fungi have been limited to the present study.

Phytophthora citrophthora has been reported by other workers from groves in Tulare County, just north of the Tehachapis, and species of Pythium have been reported elsewhere in California. However, it is very suggestive that these fungus species are not found there naturally, when one studies the movement of balled plants or seeds from infested areas. The writer is now accumulating evidence to show that such might be the case. (This hypothesis is being defended as "nebulous").

In southern California soils, Pythium ultimum has been found 49 times in 94 samples (51%); Pythium debaryanum 13 times (13.6%); P. anandrum 6 times (6.4%). P. vexans has not been taken from the soils, and none of the Phytophthoras have thus far been obtained from the soils by any of several methods used.

The incidence of Pythium ultimum from all types of Citrus may be gleaned from the following table:

Type		Declining trees (+)	Declining trees (-)	Non-declining (+)	Non-declining (-)
Lemon	(north)	0	1	0	11
	(south)	29	27	2	7
Valencia orange	(north)	0	3	0	4
	(south)	19	18	6	13
Navel orange		6	13	5	40
Miscellaneous		3	5	0	5
Total		57	67	13	80

The incidence of Phytophthora citrophthora from all types of Citrus may be tabulated as follows:

Type		Declining trees (+)	Declining trees (-)	Non-declining (+)	Non-declining (-)
Lemon	(north)	0	1	0	11
	(south)	6	50	0	9
Valencia orange	(north)	0	3	0	4
	(south)	2	35	0	19
Navel orange		0	19	0	45
Miscellaneous		0	8	0	5
Total		8	116	0	93

It has been rather surprising that P. citrophthora has been so seldom encountered among declining Citrus trees. Methods used to "trap" this species include: (1) the plating of washed, surface-sterilized roots on agar (as in the case of avocado studies); (2) the insertion of pieces of small roots into apples; (3) the placing of pieces of lemon, orange, and tangelo rind and albedo on soil in water, as well as bits of other seeds planted similarly; and (4) placing whole lemons in pint fruit jars containing soil, pieces of root, and water not to cover the lemon. Whenever the fungus appeared, the culture was always vigorous and profuse. Pythium ultimum was abundantly secured by all of these methods.

Phytophthora parasitica and P. cactorum have each been obtained once from declining lemon; P. cinnamomi has appeared once in non-declining Valencia orange.

Fusarium and Fusarium-like forms have appeared in nearly 100% of all Citrus collections. Other fungi, as Mucors, Aspergilli, Penicillia, and Trichoderma, have been rarer in Citrus than in avocado.

The author is now making extensive maps of groves that show definite demarcation between decline and non-decline areas. Accompanying collections of soils and roots from selected trees (as heretofore practiced) tend to picture the direction of spread of the disease. It is very significant that excess water and poor drainage (in most cases) tend to initiate decline. In avocado, especially, decline seems to spread from focal points. The typical focal point is usually a swale or a point where, otherwise, water has been allowed to saturate the soil and remain for a long period.

In more northerly areas, as in Santa Cruz and Glenn Counties, where there may be standing (often stagnant) water in a grove, either Citrus or avocado, and where Pythiaceous fungi have not been taken, the trees do not show typical decline; these trees do often, otherwise, show distress.

EMERGENCY PLANT DISEASE PREVENTION PROJECT

VARIETAL SUSCEPTIBILITY OF CURRANTS TO THE CANE BLIGHT ORGANISM, AND TO CURRANT MOSAIC VIRUS

E. M. Hildebrand and Paul V. Weber

Studies on Cane Blight

Four years ago the writer (3) reported that currant cane blight was on the increase in the Hudson River Valley plantings and definitely identified the disease with the fungus, Botryosphaeria ribis Gross. & Dugg. Subsequently, the cultures isolated from cankers collected in different plantings were tested for pathogenicity and compared for virulence in 1941 on one-year-old Wilder plants originated from cuttings propagated from a single plant. In brief, this study demonstrated the presence of a variety of pathogenic strains of the fungus, ranging from high to low in virulence, killing some plants and producing only small necrotic lesions or no symptoms on others. In 1942 one highly virulent culture from this collection was selected for making a study on the susceptibility or resistance of the different currant varieties.

Through the courtesy of Professor G. L. Slate of the New York State Experiment Station at Geneva, dormant cuttings collected in midwinter were

Table 1. Susceptibility or resistance of currant varieties to (A) the cane blight fungus, Botryosphaeria ribis Gross. & Dugg., and (B) currant mosaic virus[a]

Variety	Cuttings: Planted	Cuttings: Growing	A: Cane Blight: Inoculated[b]	A: Cane Blight: Positive	C: Growth condition of plants in 1943: Fruit: Size	Fruit: Yield	Fruit: Color	B: Mosaic: Inoculated	B: Mosaic: Positive	Remarks[d]
	No.	No.	No.	No.				No.	No.	
Bar-le-Duc (Wooster)	11	9	3	2	small	low	W	4	2	
Chautauqua	11	8	3	1	medium	low	R	3	1	
Cherry	11	11	3	2	"	low	R	4	0	
Comet (Wooster)	11	10	3	2	"	none		4	3	
Crandall	12	8	3	0	"	none		3	3	
Diploma	11	9	3	3	"	low	R	4	1	
Everybody	12	9	3	0	"	low	R	4	1	
Fay	12	11	3	0	small	none		4	0	
Fay's Neue Frühe	12	10	3	3	"	low	R	3	1	
Filler	11	8	2	2	medium	low	R	4	0	Crinkle and distortion of leaves
Fox New	10	10	3	0	"	none		4	0	
Imperial Rouge	10	10	3	3	"	low	R	4	2	
Knights' Sur Red	11	9	3	0	small	low	R	3	2	
La Constante	11	11	3	0	small	low	R	4	2	
La Fertile	10	10	3	2	large	fair	R	3	2	
La Native	11	11	3	2	medium	low	R	4	0	
Laxton's No. 1	11	11	3	1	"	fair	R	4	0	
Littlecroft	12	12	3	0	v.small	low	R	4	3	
London Market	11	10	3	1	medium	low	R	4	2	
Minn. No. 52	12	9	3	2	large	fair	R	3	1	
Minn. No. 61	12	11	3	2	small	none		4	2	
Minn. No. 63	12	12	4	4	medium	low	R	4	0	
Minn. No. 69	12	9	3	3	"	low	R	3	0	
Minn. No. 70	12	10	3	2	"	none		4	0	
Minn. No. 71	11	10	3	1	"	none		4	4	
Minn. No. 77	11	10	3	0	"	low	R	4	0	
Minn. No. 78	12	11	4	3	"	low	R	4	3	
No. 1964	11	11	3	3	large	low	R	4	0	
No. 1974	12	11	3	3	large	fair	R	3	0	

No. 1964	11	11	3	3	large	low	R	4	0	
No. 1974	12	11	3	3	large	fair	R	3	0	
No. 2110	11	8	2	0	small	none		3	2	
No. 2266	11	10	3	1	medium	low	R	4	3	
No. 2327	12	11	3	0	small	low	W	4	2	
No. 2486	13	13	3	3	large	low	R	4	7	
Perfection	11	11	3	0	small	low	R	4	3	
Pomona	11	10	3	1[c]	small	none		3	1	
Prince Albert	11	7	3	0	large	low	R	3	1	
Red Cross	12	10	3	3	medium	low	R	3	3	
Red Defiance	11	11	3	1	"	fair	R	4	2	
Red Dutch	12	12	4	0	"	low	R	4	2	
Red Lake	11	10	3	2	v.large	fair	R	4	0	
Red Hollandische	11	11	3	2	small	fair	R	4	0	
Rosenrote	12	10	3	3	small	low	R	2	1	
Rouge d'Angers	12	11	3	2	small	low	R	3	3	Crinkle and tipburn of leaves
Scotch	12	10	3	1	v.small	fair	R	4	0	
Stevens No. 9	12	10	3	1[c]	small	none		4	0	
Versailles	11	11	3	3	medium	low	R	4	0	
Victoria	11	10	3	1	small	low	R	3	0	
Viking	14	6	2	2	small	none		2	1	Crinkle and chlorosis of leaves
White Dutch	11	11	3	0	large	good	W	4	2	Crinkle and rosette of leaves
White Grape	11	8	3	1[c]	small	low	W	4	0	
White Imperial (Wooster)	11	4	2	2	small	fair	W	1	1	
White Transparent	12	11	3	2	medium	good	W	4	4	
White Versailles	12	11	3	1	large	good	W	4	3	
Wilder	66	54	3	2	large	low	R	4	3	
Wilson's Long Bunch	12	12	4	1	medium	fair	R	4	0	

[a] The fungus inoculations were repeated in 1942 and 1943; the virus inoculations were repeated in 1943 on all varieties to show symptoms.

[b] Considered positive when inoculated cane was killed above point of inoculation.

[c] Of apparently insusceptible plants only 3 varieties (ringed) when reinoculated showed necrosis at points of inoculation, but this was below the threshold level of cane blight employed.

[d] Abnormalities observed in all plants of a given variety. No natural cane blight or mosaic observed in checks.

obtained of 55 different varieties of currants. Early in 1942 these cuttings were planted about 4 inches deep in well-drained sandy loam soil, spaced about 8 inches apart, with the varieties randomized. Most of the cuttings grew and were ready for inoculation by mid-July when symptoms of advanced stages of infections from natural inoculations were showing in Hudson Valley plantings. Some 5-10-5 fertilizer was applied both sides of the rows early in 1943.

Inoculations were begun and completed during the week of July 17 employing a simple technique. From 2 to 4 plants of each variety were inoculated. With a sterilized scalpel a cut was made at an angle of approximately 45 degrees from the vertical into both the young and older stem growth. Then a small cube of agar containing a week-old growth of the fungus was inserted into the wound, and this location was marked and contamination excluded by wrapping a small strip of adhesive tape around the stem.

Observations were made one month later on August 17. Table 1A summarizes the results of these inoculations. It will be noted that 38 of the 55 varieties were susceptible. All insusceptible varieties were reinoculated on August 19 and when observations were made one month later only 3 of the 17 reinoculated varieties showed infection, namely, Pomona, Stephens No. 9, and White Grape. When reincoulated the following year, the 14 insusceptibles remained so. The numbers positive (Table 1A) denote plants suffering death of the inoculated cane. Small necrotic lesions at the point of inoculation, while not considered negative and not recorded as positive in the table, probably represent a certain degree of disease resistance.

Conclusions. The results of the preliminary studies on the cane-blight pathogen in 1941 demonstrated the presence of great variation in the virulence of strains. This inoculation study indicated considerable variation in the resistance or susceptibility of the 55 varieties tested with the highly virulent culture of the organism. None of the uninoculated check plants showed symptoms.

In order to find whether there was any correlation between growth condition of the plants and susceptibility, records were made on plant size and fruiting (Table 1C). There was considerable variation between varieties in size and time of maturity as represented by fruit bearing. Since the growth characteristics within varieties were relatively uniform, the variation between varieties presumably represents varietal characteristics rather than poor growth status of the plants for susceptibility evaluation.

As a result of this study it would appear feasible to breed currants for resistance to cane blight. Unfortunately the 2 most widely grown varieties, Wilder and Red Lake, are rather susceptible to the disease.

Studies on Currant Mosaic

Because adequate plants were available the 55 varieties of currants were also tested for susceptibility or resistance to the currant mosaic virus (2). The chip-bud method of virus transmission, which can be used any time of the year, was employed. Based on previous experiments, this inoculation technique gave from 65 to 100% transmission in experiments on the Wilder variety. Three or 4 plants were therefore considered adequate in number for evaluating the susceptibility of each variety. Infections were considered positive when a minimum of at least one branch showed typical symptoms

on the foliage. Symptoms on single leaves, while not considered negative, were treated in the table (1B) as resistant and therefore are not recorded as positive.

Of the 55 varieties 35, or 63.6%, were found susceptible to currant mosaic. A peculiar crinkle symptom, the cause of which is unknown, was found on 4 varieties of which 3 were susceptible to currant mosaic and 1 insusceptible. It was of interest to observe that the newer commercial Red Lake variety appears to be insusceptible to infection by this virus. Unfortunately it was not possible to make a more thorough test to verify this point.

Ten susceptible and 10 insusceptible varieties were taken at random from this experiment early in the 1942 season and indexed on Turkish tobacco in the greenhouse for presence of the ringspot virus, which is so commonly associated with the mosaic symptoms on currant (4). Since only the juice extract from the plants showing typical mosaic symptoms produced ringspot on tobacco it was concluded that the symptomless varieties did not contain this virus. Because certain varieties appear to be highly resistant to currant mosaic virus any breeding program for improving this fruit might well include resistance to this virus, to the cane blight fungus, and to other diseases. This point is especially important because satisfactory control measures have not been developed based on the principles of protection, eradication or exclusion.

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SPRAY EXPERIMENTS WITH ORGANIC FUNGICIDES FOR THE CONTROL OF APPLE BITTER ROT

John C. Dunegan, John W. Roberts, and M. C. Goldsworthy

Three organic fungicides and bordeaux mixture (Table 1) were used at Centerton, Arkansas, in 1944 for the control of bitter rot (Glomerella cingulata) in an Ada Red apple orchard where the crop had been destroyed by this disease in 1942 and 1943.

There were 4 replicates of each of the 5 treatments in an experimental design consisting of 20 randomized plots. Disease counts were obtained from 2 trees in each plot and a total of 90,153 apples were examined from the 40 record trees.

Although designed primarily as a bitter-rot control experiment, it was hoped that scab-control data also could be obtained since the Ada Red variety is very susceptible to the apple scab fungus, Venturia inaequalis. The organic fungicides, therefore, were applied in a full season schedule of 8

applications, including early applications for scab control and 4 cover sprays for bitter-rot control. However, the scab-control phase of the experiment had to be abandoned when it became evident late in April that, unless the check plot trees were sprayed, the scab fungus would destroy the crop on these trees before the period of bitter-rot infection began.

Table 1. Materials used in the 1944 apple bitter-rot control experiment at Centerton, Arkansas.

Treatment	Pounds per 100 gallons	Number of applications[a]
Bordeaux mixture	4-6	4
Ferric dimethyldithiocarbamate[b] (Fermate)	1 1/2	8
2,3-dichloro-1, 4-naphthoquinone[b] (U. S. Rubber #604)	1	8
Disodium ethylene bisdithiocarbamate[b,c] (Dithane, HE-175), zinc-sulphate, hydrated lime	1-1-1/2	8
Check		0

[a] The bordeaux plots and check plots were sprayed with lime-sulfur 4 times during the scab infection period; the 3 organic fungicides were applied 4 times during the scab infection period and 4 times for bitter-rot control.

[b] No lime was used with the 3 organic materials when combined with arsenate of lead.

[c] Zinc-lime not added in first 4 applications.

Apples infected by the bitter-rot fungus were first observed on June 10 and the disease continued to develop on the check trees until the crop was harvested early in August. The results (Table 2) show that U.S. Rubber 604 was definitely superior to the other materials.

Table 2. Summary of the results - 1944 apple bitter-rot control experiment.

Treatment	Total number apples examined	Number with bitter rot	Percent bitter-rot infected fruit[a]
Bordeaux mixture	15,098	7,948	52.6[b]
Fermate	22,086	6,481	29.3
U. S. Rubber 604	23,415	2,853	12.1
Dithane + zinc-lime	16,798	12,206	72.6
Check (no spray)	12,756	11,467	89.8

[a] Examination of the data using analysis of variance shows that a difference of 12.50% and of 17.52% are required for statistically significant differences at the 5 and 1% levels, respectively.

[b] These figures are the means of the 4 replicates of each treatment.

The reduction of bitter-rot infections to an average loss of only 12.1% of the fruit in an orchard where the fungus had caused loss of the commercial crop in the 2 preceding seasons and destroyed approximately 9/10 of the crop on the check trees in 1944 indicates a very high degree of effectiveness against the bitter-rot fungus.

This field demonstration of the efficiency of U.S. Rubber 604 was not an unexpected result as one of the writers (Goldsworthy) had found this compound highly toxic to the conidia of Glomerella cingulata in laboratory tests. Furthermore, Terhorst and Felix[1] have reported that the compound is highly toxic to an allied organism, Glomerella gossypii.

The trees sprayed with U.S. Rubber 604 showed no spray injury on the leaves throughout the season but this material caused a definite spotting of the fruit. The spots, which were the exact shape of the dried masses of spray residue, were most numerous in the calyx region but also occurred on other parts of the apple.

The injury, which appeared merely as a brown spot on the epidermis when the spray residue was rubbed off, was extremely superficial, involving only the epidermis and one or two layers of hypodermal cells, and at harvest time was to a great extent masked by the red color of the mature fruit. However, this injury might prove objectionable on the light colored fruits of varieties such as Grimes Golden or Golden Delicious.

Fermate did not cause injury to the fruit but was less effective since significantly more apples were destroyed by bitter-rot on the Fermate plots than on the U.S.Rubber 604 plots.

The poor control obtained with bordeaux mixture may have been caused by the use of a summer oil in combination with the bordeaux mixture and arsenate of lead to enhance codling moth control. Other investigators have noted that the addition of oil to bordeaux mixture lowers the efficiency of the copper component of the spray. Under the circumstances, a 6-8-100 bordeaux mixture should have been used.

Dithane was the least effective of the materials used, but may have been used at too high a dilution.

DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES, BUREAU OF PLANT INDUSTRY, SOILS, AND AGRICULTURAL ENGINEERING, AGRICULTURAL RESEARCH ADMINISTRATION, U. S. DEPARTMENT OF AGRICULTURE, IN COOPERATION WITH ARKANSAS AGRICULTURAL EXPERIMENT STATION.

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1 Terhorst, W. P. and Felix, E. L. 2,3-dichloro-1, 4-naphthoquinone; a potent organic fungicide. Industrial Eng. Chem. XXXV 12, pp. 1255-1259, 5 figs., 1943.

CORN ROOT ROT IN IOWA IN 1944

Edgar F. Vestal

Root rot of corn, as of many other crop plants, was extremely serious in 1944. Probably the most important single factor contributing to the losses was the weather. The following table is from the Iowa Weather and Crop Bulletin for September 29, 1944.

Table 1. Iowa crop season weather, 1944, by weeks. Average rainfall and mean temperature, with departures from the normal, for each week, and total rainfall and average temperature with departures, for the season April 1 - September 26, as derived from records of 28 selected stations.

Week ending	Rainfall Inches: State Average	Departure:	Temperature °F: Mean	Departure
April 4	.02	- .26	35	- 8
11	.99	+ .42	46	0
18	1.13	+ .50	42	- 6
25	1.80	+1.12	47	- 4
May 2	.75	- .01	55	+ 1
9	1.48	+ .64	47	-10
16	.59	- .34	68	+ 9
23	2.72	+1.74	71	+ 9
30	.92	- .12	71	+ 7
June 6	.70	- .34	74	+ 8
13	3.39	+2.33	63	- 4
20	.80	- .25	74	+ 5
27	.55	- .50	78	+ 6
July 4	.71	- .21	73	+ 1
11	1.14	+ .27	76	+ 2
18	.99	+ .18	72	- 2
25	.40	- .36	71	- 3
Aug. 1	1.43	+ .65	72	- 2
8	1.00	+ .18	76	+ 3
15	.24	- .62	80	+ 7
22	1.18	+ .34	71	0
29	2.13	+1.34	64	- 6
Sept. 5	.47	- .38	69	+ 1
12	.49	- .48	63	- 2
19	.70	- .29	67	+ 3
26	.81	- .11	61	- 1
For the season	27.53	+5.44	65	+ 1

A survey of the weekly rainfall and temperature from April 4 to September 26 will show that there were at least 3 critical periods of growing weather during the season.

The first period included April and the first 2 weeks of May, which is normally preplanting time. Although the average rainfall during this period was not excessive, the temperature was well below normal. Little corn was planted, and the little that went into the soil did not get an opportunity to grow. The rainfall during this period delayed the normal planting season. During the rest of May and the first week of June weather was warm, and, although there was one week of heavy rainfall, the general crop weather was good for corn.

The second critical period came in the second week of June, when the average rainfall for the State was 3.39 inches, over 2 inches above normal, and floods resulted over much of the corn section. Temperatures for the State during this period averaged 64° F, a range of 2° below normal for the southeastern part to 6° below normal for the central and northern parts. Many fields were flooded for days, resulting in death of or serious injury to the primary roots. In isolations made from diseased roots by Dr. G. M. Watkins, Research Associate Professor at the Iowa Experiment Station, at least 50% of the fungi obtained were species of Pythium, the others being mostly Fusarium moniliforme and Gibberella saubinetii [G. zeae].

The latter part of July saw a period of below-normal temperature extending into the first week of August. State Meteorologist Chas. D. Reed recorded temperatures of 4° and 5° below normal for a number of sections of the State. Above-normal rainfall for much of the period aided the fungi, but the heavy rainfall during July and August also favored the corn, since it made possible the production from the prop roots of secondary roots that were able to supply the plants with enough food so that growth appeared more or less normal.

In corn examined on low-lying or poorly drained areas during the latter part of June and early July, many of the main roots were dead and most of them were diseased. Farmers in the vicinity of the Skunk River in the Cambridge area complained that their corn had no roots at all. One man was ready to write off his entire crop as a failure because he was sure that it would not survive the normal dry period to be expected in July and August. A combination of excessive water and fungous attack had completely destroyed the root system. However, the continued rainfall during July and August saved the corn. It permitted the prop roots to extend into the soil and develop secondary roots, with the result that when this farm was visited during the latter part of August, the corn was from 7 to 9 feet tall and appeared capable of yielding upwards of 70 bushels an acre.

The third critical period of the season was the last week of August, when rainfall was 2.13 inches and the temperature fell to 64°, 6° below normal. Excessive moisture during the previous weeks permitted the root-rotting fungi to remain active and all they needed to attack again was optimum temperature. Examination of the root systems at that time disclosed that all of the primary roots were gone in most cases and that many of the secondary roots were badly diseased.

As long as rainfall was ample the corn remained green and to all appearance normal, but with below-normal rainfall in September plants with reduced root systems began to show evidence of early maturity. By the end of September this was noticeable in many sections. Some of the farmers in Winneshiek County became alarmed, and Mr. E. J. Weigle, County Extension Director

at Decorah, brought samples of the corn to Mr. E. P. Sylwester of the Iowa Extension Department. These samples possessed very few normal roots; all were dead or badly diseased and many were completely decayed.

A survey of corn fields in the area from which these specimens came gave the same general picture as for other sections of the State: few primary roots remaining and secondary roots dead, decayed, and diseased. However, when the plants reported by the growers as dying were examined, it was found that most of them bore two good-sized ears, apparently a heavy drain on the plants which had given up all of their strength to the ears. The stalks, in many cases, were soft and easily crushed. It seemed that these plants had done a remarkable job to develop the two ears in spite of the diseased root system. Most of the ears were fairly well matured. The early maturity had attracted the attention of the farmers, who thought that some sort of blight had attacked the corn.

Isolations made from some 98 different sections of diseased corn roots by Dr. Watkins yielded at least a Fusarium sp. in every case. In addition to the Fusarium, which was mostly F. moniliforme, 32 isolations gave Gibberella saubinetii [G. zeae], and from others were obtained Alternaria, Trichoderma, etc. Thus, the proportion of root parasites changed from an early-season predominance of Pythium spp. to almost 100% Fusarium in the late season.

Season losses due to root rot parasites are hard to estimate, but in many sections 30% would be a conservative figure. The overall State loss would probably be between 15 and 20% for all varieties.

Other Diseases Observed on Corn. During the period ending September 30, surveys were made which included some 22 counties of Iowa. In comapny with Mr. E. P. Sylwester, and a part of the time with Dr. A. L. Bakke a survey of the area in the vicinity of Cherokee was made, especially the farm of the Cherokee State Hospital. Later, with Mr. Sylwester, a survey was made of the south central part of the State.

At this time it appeared that 85 to 90% of the corn which was intended for harvest as ear corn was past the frost danger. Stalks were green in many cases but the grain was hardening rapidly and the shucks were drying. Many stands were uneven and much of the corn was uneven but farmers in general expected a fair harvest. Much of the unevenness of stand and growth may be due to variety and hybrid variations in vigor.

Variations in growth are not more noticeable than variations in amounts of disease, differences between fields being greater than within fields. Between fields Rust [Puccinia sorghi] attack varied from a trace to severe injury or killing of the lower leaves. Most severe injury was noticed in the southern part of the State. In general the more vigorous and uniform the field the less the Rust infection. Smut [Ustilago maydis] infections presented very much the same type picture. One field near Cherokee contained some 30% smutted plants but the average would be between 5 and 10%. Most of the Smut observed was above the ear on the stalk and tassel. Probably only from 1 to 2% of the plants bore smutted ears.

A Helminthosporium sp. appeared common on the leaves of corn this season. In one field in Marion County, southeast-central Iowa, fully 100% of the plants were infected with many of the leaves 50 to 80% dead or dying.

Ear Rots were not serious at this time in the areas surveyed. Diplodia [zeae] Ear Rot was found in amounts from 1 to 2% and Gibberella from 10 to 15%. Although the number of ears with Gibberella Rot was greater than the

number of Diplodia-rotted ears, the damage was not great. Most of the ears with Gibberella Rot had been attacked by ear worms, which so far had done much greater damage than the fungus.

Potash Deficiency symptoms were observed in a number of areas. In Delaware County the corn on 2 adjacent farms was severely dwarfed. All of the plants bore symptoms of Potash Hunger, the amount of dwarfing being in direct proportion to the severity of the symptoms. Phosphorus Deficiency symptoms were also observed in a number of cases.

EMERGENCY PLANT DISEASE PREVENTION PROJECT

DISEASES OF CORN IN NEBRASKA AND KANSAS

C. M. Slagg

Corn Diseases in Nebraska. The most serious corn diseases observed in eastern Nebraska during September are the Stalk and Ear Rots; in the western part of the State Smut (Ustilago maydis) is the most damaging disease. Despite diseases, a very large corn crop will be harvested, probably the largest in Nebraska history.

Diseased stalks caused considerable losses from "breaking over" in the eastern half of the State. In all cases, the stalks appeared to have been weakened either by infection with Diplodia zeae or by Fusarium species. Charcoal Rot (Rhizoctonia [Sclerotium] bataticola) was not found east of York and Norfolk, and where found did not appear to be associated with "breaking over." Premature ripening of stalks with poor to moderate ear development is common in most fields surveyed and appears to be due to root and crown infection by Diplodia or Fusarium species.

Ear Rots are widespread and causing considerable losses, which may be greatly increased if wet autumn weather ensues. Diplodia zeae is probably the most damaging of the Ear Rots, with Fusarium species nearly as bad, and worse in some fields where ear worm infestation is severe. Cob Rot (Nigrospora sphaerica) is widespread both east and west, but has not yet caused as much damage as Diplodia and Fusarium.

Rust (Puccinia sorghi) and Bacterial Leaf Spot [undetermined] are rather universally distributed in Nebraska in 1944, but appear to be causing only minor damage.

On the basis of counts made in 39 fields in 19 counties in the eastern third of the State during September 25 to September 29, the average measurable losses from corn diseases in this area were 11% of the total crop, distributed approximately as follows: Diplodia Ear Rot 4%, Fusarium Ear Rot 3%, Smut 3%, Nigrospora Ear Rot 1%, Bacterial Leaf Spot trace, Rust trace.

Corn Diseases in Kansas. The most serious corn diseases observed in eastern Kansas during the period September 19 to October 14, are the Stalk and Ear Rots. These diseases are favored by wet weather, so that the excessive rainfall in the eastern and southeastern counties the last 2 weeks has increased losses from Ear Rots.

Probably 90% of the fields surveyed are fully ripe, and can only deteriorate by further standing in the field. Despite the apparent large losses from diseases, a very large and good corn crop is in prospect if favorable dry weather for harvest can be had.

Considerable "breaking over" and premature ripening of stalks has been caused by root, crown and stalk infections with Diplodia zeae and Fusarium species. Charcoal Rot was found present even in the wettest fields if the stalks were overmature, but was not present in any field unless the crop was completely ripened and the stalks were undergoing the natural process of disintegration.

Bacterial Leaf Spot [undetermined] and Rust were rather universally distributed, but measurable damage from these diseases was slight.

Based on counts made in 28 fields in 18 counties in the eastern third of the State during the week of October 3 to October 7, the average measurable losses from corn diseases in this area were 18% of the total crop, distributed as follows: Diplodia Ear Rots, 7%; Fusarium Ear Rots (Gibberella saubinetii [G. zeae] and Fusarium moniliforme) 5%; Smut 3%; Nigrospora Ear Rot 2%; Diplodia Stalk Rots 1%; Bacterial Leaf Spot trace; Rust trace.

In the western half of Kansas, a higher proportion of corn plants were infected with Smut, and this disease caused more damage than any other corn disease in this area. On the basis of 11 corn fields examined in 5 Northwestern counties the measurable loss from diseases was estimated at 12% of the total crop, with Smut causing 8% loss, Ear Rot (all F. moniliforme) 4%; and Rust, Bacterial Leaf Spot, Charcoal Rot, and Nigrospora Ear Rot, each a trace.

EMERGENCY PLANT DISEASE PREVENTION PROJECT

OTHER REPORTS ON CORN DISEASES

Reports are of Emergency Plant Disease Prevention Project surveys.

FUSARIUM SHEATH SPOT IN VIRGINIA AND WEST VIRGINIA. The species of Fusarium previously reported (PDR no. 27, p. 868) as causing large white spots with purple margins on leaf sheaths in Virginia and West Virginia has been identified by Dr. Lindsay S. Olive as Gibberella zeae. This disease blights the leaf blades above the sheath spot, and has caused premature death of lower leaves. It may be partly responsible for the condition so common in Virginia and the Carolinas, where the leaves on the lower half of the plant are dead and brown before the plant has tasselled. -- R. E. Atkinson, September 18-30

STALK AND EAR ROTS IN INDIANA: Surveys in west-central Indiana were made during the period ending October 7, 1944. The area covered included Tippecanoe, Warren, Montgomery, Hendricks, Marion, Boone, and Clinton Counties.

Most fields were well advanced toward maturity and in several, harvesting was in progress. Several fields were observed which may not make a crop, due, probably, to late planting combined with dry weather in July and August.

In the maturing and well advanced fields, Stalk Rot, caused by Diplodia zeae, varied in prevalence, decided differences being noted between fields. Not counting acreage, the average prevalence for all plantings was nearly 25%. One Warren County field of nearly 100 acres showed only a trace and an 80-acre planting in Boone County only 1% of the plants with Stalk Rot. Nearby, fields could be found with 10 to 25% and even 60% of the stalks infected with Diplodia zeae.

Ear Rots were common and the severity greater than 2 weeks ago. The usual ear-rotting fungi, Diplodia zeae, Penicillium sp., and Fusarium moniliforme, were present as a trace to 1% in all fields where the percentage of infected ears was not higher. Occasional scattered kernels and the tip kernels of 25 to 50% of the ears were infected in several fields. Much of this rotting was at points where bird or worm injury was present. Fusarium had progressed on individual ears so that as many as 50% of the kernels were infected on occasional ears in a few fields. Gibberella rot (Gibberella zeae) was noted only occasionally as was Diplodia ear rot. Smut was present in all fields from occasional plants to 5%. -- J. S. Tidd.

CORN DISEASES IN OKLAHOMA: Approximately 1800 acres were surveyed during the period September 18 to 30. Most of the corn examined during this period was being harvested or was observed at various granaries.

Ear Rots were found in nearly every planting, of hybrid and open-pollinated varieties. Diplodia zeae was more prevalent and destructive than any other ear-rotting fungus. In many instances, Diplodia Rot was limited to the stalk or was just beginning to appear, as the mycelial stage, at either the apical or basal region of the infected ear. A loss of 6% was observed in a small planting near Pauls Valley, based on a count of 200 ears, selected at random.

Fusarium Ear Rot (presumably Fusarium moniliforme) occurred in several of the plantings, in many cases entering the ear following injury by the corn earworm. The planting attacked most severely was observed near Durant (Bryan County) where at least 3% of the ears were infected. Most of the diseased ears, in this planting, had scattered infections of the kernels.

Smut caused appreciable reduction in kernels at the tip of ears. In one planting 40% of the harvested ears had injuries caused by Smut infections. Frequently Smut had developed in association with corn earworm injury.

Charcoal Rot was observed in several plantings; it was found to be prevalent and causing considerable damage during this growing season. In many plantings lodging occurred rather early. In several fields near Chickasha (Grady County) Charcoal Rot developed early enough in the growing season to cause some reduction in yields.

In late-planted corn in Bryan, Cleveland, Grady, and Garvin Counties specimens of Helminthosporium sp. and Puccinia sorghi were observed. In no instance was the infection causing more than negligible loss. -- Howard W. Larsh.

CHARCOAL ROT IN TEXAS: Charcoal Rot of corn was observed in fields in the coastal plain, and in the area south of San Antonio. Infection varied from traces to 100% of the plants. At the time of inspection, the plants were mature and many fields had been harvested. -- G. E. Altstatt, September 18-24.

POTATO DISEASES IN WISCONSIN

Edwin E. Honey and R. E. Vaughan

Between October 9 and 14, inclusive, County Agricultural Agents were interviewed and potato fields inspected in Sauk, Jackson, Clark, Eau Claire, Dunn, Chippewa, Barron, Rusk and Price Counties.

Most of the potatoes in these counties had been harvested prior to this week; however, in some cases harvesting was still under way. In some cases vines had just been killed by frosts occurring within the week.

In general, potato yields were low in the counties visited. Severe rains, followed later by drought and high temperature in August, had damaged the stands. Late plantings of potatoes appear to have escaped some of the severe weather and were yielding better results than the earlier plantings.

The general tendency for the smaller potato growers to cut down or discontinue potato planting, and for the larger growers to increase their acreage, was very pronounced in the counties visited. Dairying was more attractive to the smaller growers who could not afford the high overhead investment in equipment, etc. necessary for potato production. Many former growers were now buying their own potato supply.

From a trace to a slight amount of Late Blight [Phytophthora infestans] tuber rot was observed in Chippewa potatoes in Clark and Rusk Counties, in Irish Cobblers in Rusk County, and in Russet Rurals in Barron and Rusk Counties. The Jackson County Agricultural Agent reported tuber rot present in his county. Tuber infection was not observed in many fields or storage houses inspected and appears to be of slight importance in this part of the State to date.

In Chippewa County Bacterial Ringrot [Corynebacterium sepedonicum] was found present on Cobblers and Sebagos; in Barron County it was severe in Katahdins, moderate on White Rose and slight on Bliss Triumph and Red Warba; in Rusk County it was from slight to moderate in amount on Russet Rurals. Bacterial Ringrot appears to be an important problem in Chippewa and Barron Counties and to a lesser degree in Rusk County; and infection is traceable largely to out-of-State common stock seed brought in during 1943.

Scab [Actinomyces scabies] was found in from a trace to severe amounts on all varieties in all counties visited. As found earlier in the central part of the State, this is a Scab year, although not as severe as last year.

Not many living vine tops were found on this inspection trip since most tops had matured or been killed by frost coming during this week. Notwithstanding, a moderate amount of leaf infection of Early Blight [Alternaria solani] was observed on Sebago in Eau Claire County. No tuber infection has been observed to date.

On one farm where about 600 bushels of Red Warba were harvested during the severe heat of last August, considerable storage rot was resulting. One hundred bushels had been sorted out and discarded and the bin needed to be sorted again. This loss appeared to arise from Heat Injury occurring at the time of harvest which afforded avenues for storage rot organisms to enter and develop. Other varieties harvested later and put in the same storage were not giving this trouble.

Hollow Heart [physiogenic] was observed especially in oversized Sequoia in Chippewa County.

Damage to tubers by grubs was observed in all the above-named counties visited.

EMERGENCY PLANT DISEASE PREVENTION PROJECT, and
UNIVERSITY OF WISCONSIN

OTHER REPORTS ON POTATO DISEASES

Reports are of Emergency Plant Disease Prevention Project Surveys.

LATE BLIGHT AND OTHER DISEASES IN MASSACHUSETTS: Because of the presence of Late Blight (Phytophthora infestans) in most of the Connecticut River Valley potato fields in Hampshire and Franklin Counties the last week of September it was thought advisable to reexamine the area again this week. Two weeks ago when digging was well under way Late-Blight infected tubers could be found in most fields. However, as tuber infection apparently followed the hurricane rains of September 13-15, the interval of time had not been great enough by the last week of September for soft rot to develop.

The present survey was made in company with Dr. O. C. Boyd and the respective county agents of Hampden, Hampshire and Franklin Counties, and covered the potato area from the Connecticut State line to the Vermont State line. Yields are generally good in both the valley and hill areas. However in Hampden County where the summer droughts were most severe the yields probably average 50 to 75 bushels per acre less than in Hampshire and Franklin Counties.

Late Blight was present in the low areas of practically every Valley field in Hampshire and Franklin Counties but absent or negligible in the hill fields. In the Valley the low areas of many fields are not being dug. Where the low areas are dug losses often amount to about one-half, or on an acre basis at a rate of 175 to 200 bushels per acre. In Hampden County a trace of tuber blight was found in approximately one-half of the fields but the incidence of blight was of no consequence in comparison with the Valley fields of Hampshire and Franklin Counties.

Two fields of Sebagos were seen where the blight fungus was heavy on the tops but very little tuber infection was found. What tuber rot existed was soft rot due to standing water rather than to blight rot. In an adjoining field of Green Mountains there was so much blight rot in the low areas that those areas were not dug.

Bacterial Ringrot (Corynebacterium sepedonicum) was found in 2 fields heretofore unreported. Only a trace was present in each case. One field was in Westfield (Hampden County) and the other in Hatfield (Hampshire County). This makes a total of 8 fields in which Ringrot has been found this year in the Connecticut River Valley fields of Massachusetts. -- Robert C. Cassell, Emergency Plant Disease Prevention Project. Oct. 9-14.

DISEASES IN A NORTH CAROLINA FIELD: An inspection was made of a single small field of the Sequoia variety in Yancey County, in which the grower was trying to produce certified seed. According to the county agent, Mr. V. J. Goodman, last year there was a little Scab (Actinomyces scabies) in a single small spot in the field. The Purple Top disease [Aster Yellows Virus] was also present.

When I visited the field the plants had been dead for several weeks. Ten potatoes in 10 random plots were dug to check on Scab, which was found in all 10 plots; 43% of the marketable potatoes dug were infected. Some tubers with a soft, watery rot were found and sent to Dr. Lindsay S. Olive, who found a Fusarium sp. to be the main cause, with Sclerotium rolfsii also present. The grower had not been advised to treat his seed before planting. -- Alton E. Prince, weeks of September 25 and October 2.

BACTERIAL RINGROT AND OTHER DISEASES IN SOUTHEASTERN IDAHO: In Teton County, visited during the week ending September 23, a heavy frost a few days previously had killed the potato vines, and yields would be materially reduced. Blackleg (?) [Erwinia phytophthora] was severe in some of the fields this year, and was still evident after the vines had frosted down.

In the upper Snake River Valley, especially in the older potato-growing areas, premature ripening and dying of potato vines was very evident. In some cases the condition was very spotty in a field, while in others it was confined largely to portions of the field where soil fertility was low and where potatoes had been grown before, during the last year or so.

As a general observation Bacterial Ringrot is more prevalent this year than last. Exact comparison is impossible, but from observations in sorting houses and in the field, and from statements made by inspectors, it seems to be true. This situation probably results from some general reduction in the grade of seed used, and from spread from infected lots.

The latter part of the week ending October 7 was spent near Aberdeen, observing potatoes as they were being dug. Bacterial Ringrot was found to be prevalent but in no case occurring in severe amounts. Blackleg was noted commonly, and in some fields common Scab was very severe on Idaho Russet. This variety is seldom affected by Scab, but soil infestation is apparently becoming more severe. Early dying of the vines, presumably from Fusarium Wilt, had materially reduced the yield in some fields.

Most of the following week was spent largely on a survey of potato fields in Bingham, Bannock, Bonneville, Jefferson, and Madison Counties. Bacterial Ringrot was prevalent, but usually in traces to moderate amounts. Scab, although confined to certain areas, is of great concern to the growers, many of whom report that infection on the current crop is the worst that they have seen. Yields generally are much lower than last year, and many crops show a high percentage of rough badly-shaped tubers. -- Earle C. Blodgett.

POTATO DISEASES IN WESTERN WASHINGTON: The appearance of small plantings from 1/2 to 2 acres, was very discouraging. These were apparently being grown for home or local consumption, and planted without sufficient consideration of the source of seed stock. In some cases it was questionable whether there was a truly healthy plant left in the plot. Virus diseases, especially Leaf Roll, and root infections diagnosed in field as principally Fusarium sp. were prevalent.

In Clark County many fields appeared from the road to have patches of Blight. On closer examination this was obviously not Blight, but the result of burning due to the combination of root infections and drying weather. As high as 25 to 30% of the plants in some fields were affected in this manner. -- Lytton W. Boyle, September 13-30.

REPORTS ON DISEASES OF TOMATO, PEPPER, AND EGGPLANT

Except where noted, reports are of Emergency Plant Disease Prevention Project surveys.

TOMATO DISEASES IN TIDEWATER VIRGINIA: In mid-June Early Blight (Alternaria solani) was causing 20% loss in a 5-acre field. The disease was more common on plants brought in from the South, although it showed up on

after the plants were set out.

A 4-acre field of Earliana was a total loss by late June, due to Fusarium Wilt [F. oxysporum f. lycopersici]. In a field of certified Rutgers 40% of the plants were infected with Fusarium Wilt.

In a 30-acre field Bacterial Spot (Xanthomonas vesicatoria) had infected 5% of the fruit on 30% of the plants.

A 2-acre field was observed in which Fusarium Wilt, Bacterial Canker [Corynebacterium michiganese], and Southern Blight [Sclerotium rolfsii] were causing considerable loss.

Southern Blight and Fusarium Wilt seem to combine to kill as high as 30% of the plants in many fields. -- R. E. Atkinson, Emergency Plant Disease Prevention Project, and G. K. Parris, Virginia Truck Experiment Station, Norfolk.

TOMATO DISEASES IN TEXAS: In the period from September 18 through October 15, surveys were made in the central and southern portions of Texas.

Fusarium Wilt was present in all fields, but percentage of plants affected was negligible except in a few fields in the Lower Rio Grande Valley, where infection varied from 1 to 3%.

Southern Blight was also found occasionally, although mortality of plants in the Winter Garden and Laredo areas was very low. In the Lower Valley, however, the organism was more active, and mortality was 14% in one field north of Mission.

A trace of Early Blight was noted in fields in the Lower Valley.

Rootknot [Heterodera marioni] nematode infestation was heavy in 2 fields west of Mission, counts showing 10 and 14% of the plants with severe injury.

In the dead portions of the tops of some plants that apparently suffered severely due to conditions at transplanting, sclerotia of Sclerotium bataticola were observed.

Virus Diseases: Common Mosaic was present in all fields. One field was seen where this disease was manifest on about 1/3 of the plants (Lower Valley). Symptoms of Cucumber Mosaic were observed on one plant near Quemado.

A trace of Curly Top was evident at Quemado, Eagle Pass, and in the Lower Valley. Spotted Wilt was found at Quemado (trace), and on about 2% of the plants in one field below Laredo. "Bunchy Top" was prevalent in the Lower Valley, infection varying from a trace to as high at 11%. -- George E. Altstatt.

TOMATO DISEASES IN WESTERN WASHINGTON: Early Blight was causing considerable loss in Thurston County. This was evident in lesions at the stem end of the fruit.

A critical estimate of Mosaic was difficult because of the prevalence of Blight in many instances. A field in King County was noteworthy. To avoid fruit rot on comparatively low land, the vines had been pruned and staked. The plot had become quite thoroughly infected with Mosaic, the virus apparently being carried on the instruments used for pruning. -- Lytton W. Boyle, September 13-30.

TOMATO SPOTTED WILT IN CALIFORNIA: One field of seed tomatoes was observed in the Salinas Valley with about 4% of Spotted Wilt. Another field showed no disease. -- Henry Schneider, October 8-14.

PEPPER DISEASES IN OKLAHOMA: Approximately 4 acres were surveyed during the latter part of August. Leaf Spot (Cercospora capsici) was observed in 2 plantings, one near Fort Gibson (Muskogee County), the other near Pawhuska (Osage County). In each instance the reduction in leaf area, was less than 2%. These infections had been observed earlier in the growing season but due to the continuous hot, dry weather conditions further development and dissemination of the fungus was prevented.. Southern Blight caused a loss of nearly 5% of the plants in a small acreage near Fort Gibson.

Approximately 5 acres in 2 plantings were surveyed during the last half of September. Fruit Rot (Alternaria sp.) caused a loss of nearly 5% in both plantings. Sun Scald resulted in a similar loss in the planting near Oklahoma City. Nearly 40% of the plants in a 3-acre planting near Oklahoma City were infected with Mosaic. Some of the plants had developed small fruits before becoming infected while others failed to produce any fruits. The disease caused a loss of nearly 20% in the planting near Muskogee. -- Howard W. Larsh

PEPPER DISEASES IN COLORADO TRUCK CROP SECTIONS: During the week ending September 23 a survey was made in Adams, Arapahoe, Boulder, Denver, Otero, Pueblo, Crowley, Lincoln, Washington, Logan, Morgan, and Weld Counties. In Denver County a few scattered plants were found infected with Verticillium albo-atrum. In Adams, Otero, and Pueblo Counties plants affected by Phytophthora capsici were commonly encountered. The heaviest amount of infection was found in the vicinity of Pueblo. Alternaria Fruit Rot was found in all fields; incidence was especially high in areas (Denver and Pueblo Counties) where the plants had been injured by hail. Mosaic (Virus) was found in trace amounts in the majority of fields inspected. Spotted Wilt was found in traces in one field in Denver County.

During the weeks ending September 30 and October 7, plant disease surveys were made in Weld County in company with Dr. J. G. McLean, Horticulturist, and Dr. W. A. Kreutzer, Pathologist, and in Adams and Denver Counties in company with Mr. J. L. Forsberg, Assistant Pathologist, of the Colorado Experiment Station. Phytophthora Wilt (P. capsici) was found in all pepper fields visited, infection ranging from a trace to as high as 75% in some fields. -- E. W. Bodine

OTHER REPORTS ON DISEASES OF PEPPERS: Anthracnose (Colletotrichum sp.) was found on about 20% of the fruits of a 3-acre planting in Cheshire, CONNECTICUT. A light to moderate infection was present, undoubtedly causing some commercial loss. -- Robert C. Cassell, October 2-7.

In a 5-acre field of Bell peppers in tidewater VIRGINIA, 100% Mosaic infection had resulted in 25% reduction by October 10. On June 19 a 2-acre field with 35% Mosaic was observed; infected plants were not bearing. -- R. E. Atkinson, Emergency Plant Disease Prevention Project, and G. K. Parris, Virginia Truck Experiment Station.

In surveys in central and southern TEXAS, September 18 to October 15, Texas Root Rot [Phymatotrichum omnivorum] was observed in a few instances on Bell peppers at Quemado and north of Mission. One field near Carrizo Springs had about 0.5% of the plants killed by Sclerotium rolfsii. Pepper Mosaic was seen occasionally; near Mission one planting showed about 20% infection. -- George E. Altstatt.

In a field of peppers observed in Santa Clara County, CALIFORNIA, August 4, Spotted Wilt was causing severe stunting of the plants and deformation of the fruits. The disease was diagnosed by Dr. Max W. Gardner. -- Henry Schneider

DISEASES OF EGGPLANT: Eggplant Yellows (Cucumber-Mosaic Virus) was controlled in most plantings in the Winter Garden area of TEXAS, and infection was generally limited to a trace. One field near Big Wells showed nearly 100% infection, and another below Carrizo Springs showed about 40%. Another field near Laredo showed 40%. In the Lower Rio Grande Valley, most fields showed traces, but 2 went as high as 20 and 30% infection. White fly was present on eggplant in the vicinity of Carrizo Springs, and many plants were blackened by Sooty Mold (Fumago sp.). -- George E. Altstatt, Sept. 18-Oct. 15.

In the vicinity of Welby in Adams County, COLORADO, Verticillium Wilt was prevalent in all fields surveyed. Infection ranged from 5 to as high as 80% in some fields. -- E. W. Bodine, week ending October 7.

ASPARAGUS RUST IN NORTHEASTERN ILLINOIS

J. S. Tidd

Because no asparagus rust (Puccinia asparagi) epidemic had been noted in Illinois since 1941 when the amount was appreciable, a report to Dr. M. B. Linn of the Illinois Agricultural Experiment Station during the last of September 1944, of considerable damage by rust to commercial asparagus fields at Rochelle in Ogle County, was one not to be overlooked. Dr. Linn investigated on October 5 and because of the seriousness of the situation accompanied the writer during the week ending October 14 on a survey of other commercial asparagus plantings in Illinois.

At Rochelle, Dr. Linn found all the canes of all plants in 450 acres infected, for the most part with the telial stage of the rust. About half of the plants were moderately to severely rusted, the remainder less so. A smaller nearby field of some 25 acres, which was severely rusted, had been left uncut this past spring due to a labor shortage and the rust had apparently built up inoculum here and spread to the other fields.

Data regarding the several fields surveyed by Dr. Linn in Ogle County as well as those inspected this past week are summarized in Table 1.

When possible, the names of varieties planted were obtained. These included the Washington strains and Paradise. Possibly new strains of the fungus have put in an appearance or climatic conditions were especially favorable for asparagus rust this season. Since most growers disk in the old plants in the spring and use no control methods, it is not impossible that another year, given optimum conditions, asparagus rust will become even more severe and that by 1946, if not in 1945, definite crop losses may result.

Table 1. Asparagus rust survey in northeastern Illinois, October, 1944

County	Size of fields surveyed Acres	Plants rusted %	Severity[a]	Remarks
Vermillion	100, & 52	100	M	Cut until June 1; occasional yellow plants.
"	3	10	L-M	Seedling field; 75% of plants dying, cause undetermined.
"	50	Trace	L	Cut until July 1; 1 yr roots set out in 1940
"	10	50	M	Cut until July 1; 2 yr roots set out in 1940
"	125	20	L-M	Cut until July 1; old field.
Iroquois	70	75	L	
"	10	90	M	
Kankakee	4, & 1	100	M	
"	15	25	L	Did not cut in 1944; 30-year-old field.
"	10	100	M	Cut until June 15; this field near uncut field just above.
Cook	2	100	L-S	30% of plants badly yellowed and covered everywhere with pust
Kendall	7	100	L	
"	6	100	L-M	
"	2	90	L-M	
Ogle	25	100	S	Did not cut in 1944.
"	450	100	L-M	Some plants yellow; this field near uncut field just above.
La Salle	10	50	L	
"	4	20	L	
"	5	100	S	Probably not cut this year; old field

[a] L = light; M = moderate; S = severe

EMERGENCY PLANT DISEASE PREVENTION PROJECT

REPORTS ON DISEASES OF CUCURBITS

Reports are of Emergency Plant Disease Prevention Project surveys.

ANTHRACNOSE ON CUCUMBER IN CONNECTICUT: A moderate to heavy infection of Anthracnose (Colletotrichum lagenarium) was found on the leaves of a late planting in Northford. -- Robert C. Cassell, October 2-7.

POWDERY MILDEW ON PUMPKIN IN NORTH CAROLINA: Powdery Mildew (Erysiphe cichoracearum) was observed causing heavy infection of pumpkin vines in Ashe and Alleghany Counties. Little damage was being done because the pumpkins were already mature. -- Alton E. Prince, September 25-October 7.

LEAF SPOT ON WATERMELON IN MISSISSIPPI: Cercospora Leaf Spot (C.citrullina) was noted in small plantings near Poplarville. -- Douglas C. Bain, August 28-September 1.

DONWY AND POWDERY MILDEWS ON CANTALOUP AND SQUASH IN TEXAS: Downy Mildew (Pseudoperonospora cubensis) was present but not severe on cantaloups at Robstown, Weslaco, Winter Haven, and in the Eagle Pass area. Powdery Mildew was also observed on cantaloups in the Eagle Pass area.

Both Downy and Powdery Mildews were observed on squash in the Winter Garden and in the Lower Rio Grande Valley. At the time of observation (October 7-13) no appreciable damage had occurred. -- George E. Altstatt.

DISEASES OF CANTALOUP AND WATERMELON IN OKLAHOMA: During the last 2 weeks of August, approximately 225 acres of cantaloups were surveyed.

Anthracnose- or Pox-infected fruits were observed in McIntosh, Muskogee, and Tulsa Counties earlier in the growing season (July 26). Very little loss resulted, however, infected fruit was not shipped by rail and had to be sold to truckers for the local markets.

Leaf Blight (Macrosporium cucumerinum) [Alternaria cucumerina] occurred in 2 plantings in Muskogee County. A reduction of nearly 20% of the leaf surface was observed in each instance.

Downy Mildew was not much of a factor in cantaloup plantings during this season. The only infected plants observed were in a small home planting near Norman (Cleveland County).

Bacterial Wilt (Erwinia tracheiphila) caused a loss of nearly 5% of the plants in a 50-acre planting near Muskogee (Muskogee County), and a loss of a few plants in a small acreage near Bixby (Tulsa County). The insect vectors were present in large numbers in each diseased planting.

Watermelon plantings totalling approximately 450 acres were surveyed.

Anthracnose occurred in McIntosh, Tulsa, Grady, and Major Counties; it was the most destructive and widespread disease of watermelon observed. Nearly every field near Bixby (Tulsa County) was infected. Many growers in this area failed to get more than 50 to 60% of No. 1 melons out of their fields. It was not at all uncommon for inspectors to turn down 35% of the melons, necessitating their sale at lower prices to be used in nongraded cars.

Fusarium Wilt (Fusarium bulbigenum var. niveum) [F. oxysporum f. niveum]-infected vines were observed near Rush Springs (Major County) and Holdenville

(Hughes County). In the affected fields near Rush Springs an average loss of nearly 10% occurred. Many of the growers, in this region, have had to abandon wilt-infested land or use it for crops not susceptible to wilt.

Blossom-End Rot (physiogenic) continues to destroy large numbers of fruits in the watermelon areas of the State. Very few plantings, if any, are absolutely free of this disease. In many cases losses of 10 to 20% are not uncommon. -- Howard W. Larsh.

DISEASES OF CUCURBITS IN COLORADO: During the week ending September 16, a trace of Powdery Mildew was observed on cantaloup in the McElmo Canyon in Montezuma County in southwestern Colorado.

In surveys during the week ending September 23, Leaf Blight (Alternaria cucumerina) was observed to be widespread on cantaloup in the Arkansas River Valley (Otero, Pueblo, and Crowley Counties), but causing only a slight amount of damage. Phytophthora Fruit Rot (P. capsici) was found in trace amounts on this crop.

Trace amounts of Phytophthora Fruit Rot were noted in one small field of watermelons.

On cucumber, Angular Leaf Spot (Pseudomonas lachrymans) was found in several fields in Otero County, and Bacterial Wilt was observed in a few plants in one field in Otero County. Mr. W. J. Henderson, Extension Plant Pathologist, reports high incidence of Mosaic (Virus) in a 40-acre field in Adams County.

On honeydew melon, Anthracnose and Phytophthora Fruit Rot were found in traces in several large fields inspected in the vicinities of Olney Springs and Crowley in Crowley County. -- E. W. Bodine.

ROOT ROTS AND MOSAIC ON CUCUMBER AND SQUASH IN WESTERN WASHINGTON: Cucumbers were generally poor due to Root Rots and Mosaic. Losses ranging from 10 to 50% were noted.

The squash crop was rather spotted due to Root Rots and Mosaic. An early frost had materially reduced the crop in one locality of Skagit County. Summer squash of various types was badly infected with Mosaic in the locality south of Kirkland (King County). In this instance it is estimated the yield was reduced between 30 to 40%. In cases of more severe loss due to Root Rot or Wilt, it was learned that because of excellent yields obtained from the original plantings several years past, attempts were made to grow the crop successively on the same plot. On a truck farm in Lewis County losses as high as 30% were evident due to Root Rot. This grower claims to have rotated cucurbits with other truck crops. When the rotation, as in this case, did not include other than truck crops, it was not proving an effective means of control. -- Lytton W. Boyle, September 15-30.

BRIEF NOTES ON PLANT DISEASES AND INJURIES

EFFECT OF THE HURRICANE ON VEGETABLE CROPS IN TIDEWATER VIRGINIA: The high wind and heavy rains of September 14 had a particularly severe effect on the snap bean crop. In many fields the lashing of the wind has produced injuries that became infected by Rhizoctonia and other soil fungi resulting in the death of a large percentage of the plants. In all fields

a sickly yellow color of bean plants is caused by the leaching of nitrate fertilizer from the soil by the heavy rains. From 5 to 6 1/2 inches of rain fell during the hurricane. Large areas of low-lying, late potato fields have been drowned by inundation.

A 60-foot row of almost mature Chinese cabbage at the Virginia Truck Experiment Station were almost 100% affected by a soft rot that developed in the stem at ground level. The plants began to wilt about 6 days after the hurricane struck.

A leaf spot tentatively identified as caused by Pseudomonas maculicola started on turnips in a field of different crucifers, then developed successively on cabbage and Chinese cabbage. It was first seen 4 days after the hurricane and there is definitely a direct relation between the blowing of soil by the wind and the location of the disease in the field. Where the plants were sheltered from the wind by trees the plants are almost free of the disease, and the amount of disease gradually increases as one leaves the sheltered area. -- R. E. Atkinson, Emergency Plant Disease Prevention Project, and G. K. Parris, Virginia Truck Experiment Station, Norfolk.

PHLOEM NECROSIS FOUND ON ELM IN KANSAS: Phloem necrosis of elm (virus) was first seen in Wyandotte County on September 19. Seven young trees forming part of a landscape planting on U. S. Highway No. 40 west of Kansas City, Kansas, were completely dead, and others were partly defoliated. These trees were seen later by Roger U. Swingle, of the U. S. Division of Forest Pathology, who made a definite diagnosis of phloem necrosis, and who also found elm trees harboring the same disease in Perry and in Topeka. -- C. M. Slagg, Emergency Plant Disease Prevention Project.